BROCHURE AND DATA SHEET

Texcel®

MARINE GRADE STAPLE FIBRE NON WOVEN GEOTEXTILES

www.geofabrics.co

WHY TEXCEL?

Texcel geotextiles are a new generation of nonwoven staple fibre geotextiles which have been developed to stabilise coastal structures and protect landfill lining systems. Manufactured from either Polyester and/or Polypropylene fibres, they have a unique staple fibre blend and an inbuilt flexibility to allow Engineers to specify mechanical and hydraulic criteria to suit tough environmental conditions.

Texcel geotextiles, which are manufactured in Australia by Geofabrics, are high quality, isotropic, nonwoven staple fibre geotextiles which are supported by 25 years of research, development and testing. They are abrasion and UV-resistant and provide superior filtration for coastal applications and excellent cushioning for landfill applications. Texcel geotextiles also have high elongation and abrasion properties minimising installation damage and ensuring effective soil contact, interaction and stability.

Geofabrics provide a high level of technical support for Designers and Engineers to make sure your project is implemented effectively and efficiently using the correct type and grade of geotextile. Continuous Research & Development is carried out at the GRID on the Gold Coast in Queensland including a full scale, specially designed, rock/boulder dropping apparatus for Texcel products.

REDUCE RISK	The Texcel R range of geotextiles are produced to strict Manufacturing Quality Assurance ensuring consistent quality for the entire project. Rolls are numbered individually and traceable back to the actual QA test results. Laboratory support is provided for the construction QA process for Texcel geotextiles.
ENHANCED PERFORMANCE AND RELIABILITY	The Texcel R range of UV stabilised geotextiles are manufactured in Australia to meet Australian and New Zealand specifications and conditions. The use and effectiveness in a large range of applications can be supported by laboratory testing and ongoing field performance.
COST BENEFITS	Texcel R range geotextiles can serve as a direct alternative to granular filter material. This allows for significant savings in both material costs and installation times. Tightly rolled rolls, up to 6m wide, provide additional transportation and installation cost savings.
DESIGN AND INSTALLATION SUPPORT	The Texcel R range of geotextiles are supported by technical assistance from our Geofabrics engineers. Installation equipment is also available to help ensure efficient and correct installation.
CUSTOM MANUFACTURING FOR SPECIFIC REQUIREMENTS	For large specialty applications in excess of 30,000 m^2 we can manufacture custom staple fibre geotextiles at our Queensland plant. These include polypropylene geotextile for alkaline environments; heat set polypropylene geotextiles and heavyweight geotextiles.

SECTOR SUITABILITY

Roads · Rail · Coastal · Waste · Mining · Civic & Landscaping · Ports & Aviation · Water · Primary Industries · Sports & Recreation · Slopes & Walls · Building

Research has shown that Texcel nonwoven staple fibre geotextiles can significantly reduce forces placed on impermeable liners, protecting them in both the short and long term.

DESIGNED FOR HARSH CONDITIONS

COASTAL, ESTUARINE & WATERWAY PROTECTION

Texcel nonwoven staple fibre geotextiles have been used on demanding coastal projects since the 1970s.

Manufactured from either polyester and/or polypropylene fibres, they have a unique staple fibre blend and an inbuilt flexibility for coastal, port and river embankment upgrades and applications. Rock revetments are a key component of many coastal, marine and river protection systems and Texcel provides tough and excellent durability when subject to constant water movement due to tidal, wave or other hydraulic forces.

REVETMENTS

The loss of soil from behind a revetment will have an adverse effect on the stability and effectiveness of any revetment. Due to their ease of construction and low cost, geotextiles have replaced granular filters in revetment applications; with the nonwoven geotextile mimicking a natural graded filter.

The Texcel range of geotextiles are designed to resist impact damage and to retain soil particles without significantly reducing the permeability requirements of the revetment.

EMBANKMENTS

High quality fill material can become contaminated when it is placed directly in contact with a soft or poor quality ground; the result being a loss of performance of the fill material. In order to limit the contamination and subsequent strength loss, geotextiles are used to separate the two distinct materials. Construction in this environment can place the geotextile separator under high stress with forces from rock placement and equipment loads needing to be transferred into the poor quality material. The Texcel range of geotextiles are ideal for this application as they combine high elongation with high strength to provide unsurpassed toughness and survivability characteristics.

SAND CONTAINMENT STRUCTURES

Texcel nonwoven staple fibre geotextiles are used in the manufacture of geotextile sand filled containers of up to 300 tonnes in size. Manufactured from either UV resistant polyester or a unique highly durable polyester/ polypropylene composite, allows the containers to be successfully used for short and long term applications in sea walls & revetments, groynes, breakwaters and emergency containment. Their development has led to them being used in artificial reefs for beach erosion protection, encouragement of sea-life habitat and surf improvement.

WASTE & CONTAINMENT STRUCTURES

Heavyweight Texcel geotextiles can be manufactured from either Polypropylene or Polyester fibres and have a unique staple fibre blend and an inbuilt flexibility designed to protect geomembrane or geocomposite liners in landfill, waste and containment systems. They are used to prevent damage to impermeable liners designed to contain harmful liquors in landfill and mining applications; the design of the liner system needs to limit the chance of punctures during installation and reduce the risk of long term stress cracking of the geomembrane.

Research has shown that Texcel nonwoven staple fibre geotextiles can significantly reduce forces placed on impermeable liners, protecting them in both the short and long term.

FILTRATION

Texcel restricts the migration of fine soil particles from a soil mass while remaining permeable to water movement at a rate at least equivalent to the permeability of the retained soil.

DRAINAGE

To allow water to flow through or within the plane of the geotextile, allowing the dissipation of pore water pressure which can have a detrimental effect on engineering structures.

SEPARATION

To separate and prevent two distinct soils or different materials from intermixing, thereby maintaining the performance of the individual materials.

LINER PROTECTION

To prevent damage to thin polymeric liners used in landfills, by limiting deformation and puncturing potential.

SHORELINE PROTECTION

To prevent erosion of coastal and shoreline areas by retaining sand and other fines while being subject to continuous wave, tidal and other wave motions. The Texcel range of geotextiles are also used to create our ELCOROCK shoreline protection system.

TECHNICAL DATA

All Texcel R range nonwoven, needle punched geotextiles are made in Australia.

Texcel R geotextiles are manufactured in accordance to ISO 9001:2015

Test	Units	400R	600R	900R	1200R
Fibre Type	-	100% Virgin Polyester Fibre			
CBR Burst Strength (AS 3706.4)	N	2,750	4,360	6,140	8,850
CBR Toughness (AS 3706.4)	kJ/m^2	2.7	5.6	8.1	9.3
Wide Strip Tensile Strength MD[1] (AS 3706.2)	kN/m	14.8	21.2	30.4	45.5
Wide Strip Tensile Strength XMD[2] (AS 3706.2)	kN/m	15.6	26.6	38.9	57.2
Wide Strip Toughness MD (AS 3706.2)	kJ/m^2	5.5	10.2	14.6	21.7
Wide Strip Toughness XMD (AS 3706.2)	kJ/m^2	5.8	12.7	18.6	30.0
Grab Tensile Strength MD (AS 3706.2)	N	820	1,250	1,790	2,800
Grab Tensile Strength XMD (AS 3706.2)	N	870	1,440	2,160	3,260
Abrasion Resistance MD/XMD (BAW Rotating Drum)	kN/m Strength Retained	7.5/6.9	17.3/17.3	22.7/26.2	34.2/40.5
12 Month Outdoor Exposure MD/XMD (ASTM D5970M-16)	kN/m Strength Retained	8.1/7.1	17.7/17.0	23.2/23.2	42.4/47.6
Hydrocarbon (Diesel) Resistance MD/XMD (AS 3706.12)	% Strength Retained	>90	>90	>90	>90
Accelerated UV Resistance MD/XMD (AS 3706.11)	% Strength Retained	>50	>60	>80	>80

Pore Size O_{95} (AS 3706.7)	µm	≤75	≤75	≤75	≤75
Pore Size O_{95} - Capillary Flow Method (ASTM 6767)	µm	182	124	126	108
Permittivity (AS 3706.9)	s^{-1}	1.41	0.69	0.45	0.30
Coefficient of Permeability (AS 3706.9)	m/s x 10^{-4}	48	34	23	20
Flow Rate @ 100mm Head (AS 3706.9)	$L/m^2/s$	141	69	45	30

Notes:

1. MD=Machine direction

2. XMD=Cross Machine Direction

3. All values are MARVs (Minimum Average Roll Values

INSTALLATION GUIDELINES

Placement procedures for Texcel should be in accordance with the project specifications. This will include compliance with stripping, grubbing and final trim, grading requirements, cover material specifications, lift thicknesses and equipment requirements. Other considerations such as placement in wind and underwater should be addressed in construction or site specific specifications.

Performance considerations such as removal of wrinkles and folds or pre-tensioning the geotextile should also be addressed as specified. Seams should be exposed with the seamed joint facing upwards, such that the seam can be inspected and repairs easily made should faults be encountered. For placement of larger 4m and 6m rolls, a Geofabrics spreader bar is recommended.

For more information about installation of Texcel nonwoven geotextiles please refer to our comprehensive Storage & Installation guide available from our website.

TECHNICAL SUPPORT

As Australasia's geosynthetic specialists, Geofabrics is able to provide additional support services to ensure the best product solution is offered on every project.

We leverage the expertise of our internal resources, including professional engineers who are specialists in their fields, to provide detailed design suggestions for your project. Our design suggestions can help fast-track your design process, provide another technical viewpoint and reduce construction costs while delivering value over the life of your project through innovative use of geosynthetics as a solution.

Our team also offer generic standard specifications and drawings to enable designers to complete project documentation faster and reduce the risk of error in the documentation.

RESEARCH & DEVELOPMENT

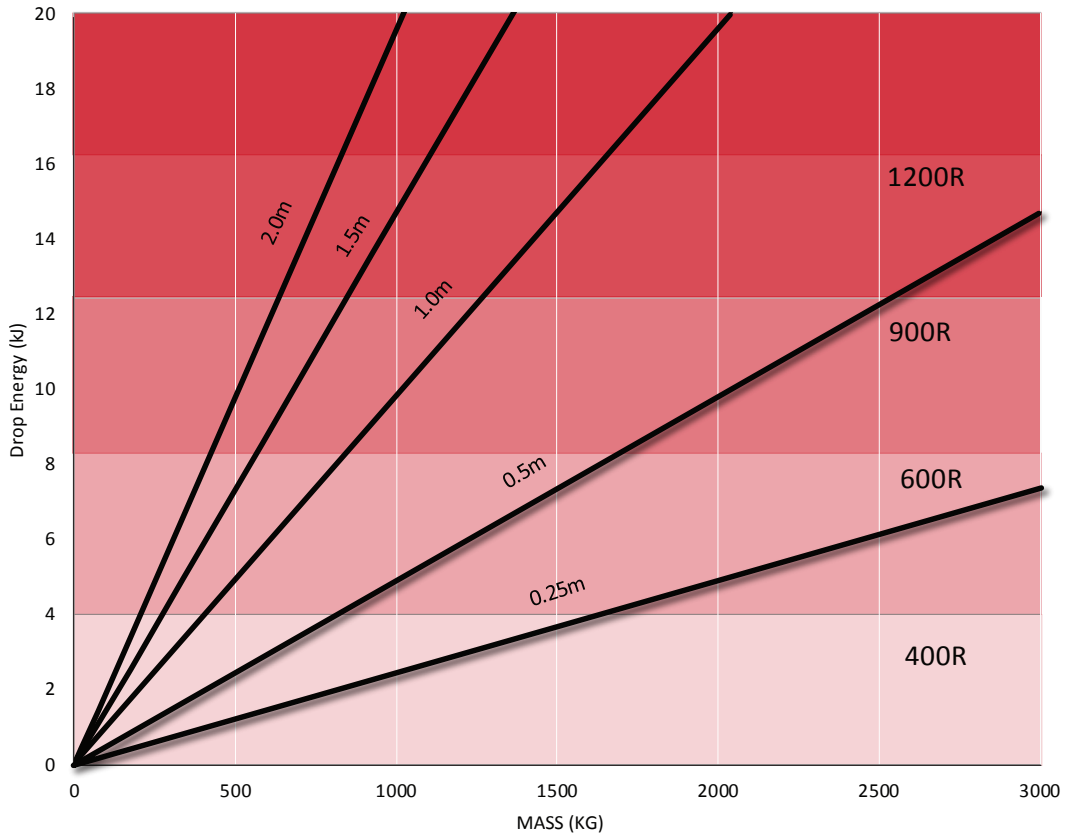
Geofabrics is committed to pursuing research and development of the Texcel R range of nonwoven staple fibre geotextiles in testing and performance in various insitu environments.

For technical information, or a tour of our Ormeau manufacturing plant or the Geofabrics centre for Geosynthetic Research, Innovation and Development (GRID), please contact your closest Geofabrics office or email GRID@geofabrics.com.au

SURVIVABILITY BEYOND INSTALLATION

Geotextiles are a very cost effective alternative to graded granular filtration systems underneath armour rock in hydraulic applications. Many applications call for revetment geotextiles to be installed under large and often angular rocks. Surviving installation without puncture is key to maintaining the long term performance of the geotextile in these critical hydraulic applications.

Following Geofabrics' investment in a state of the art staple fibre manufacturing facility at Ormeau, Queensland and the introduction of the Texcel R range of polyester geotextiles, a comprehensive research and development programme for the revetment applications for these products geotextiles was undertaken. Based on the results of this research, a geotextile design and selection method based on installation testing using full-scale testing of rocks with Texcel R geotextile revetment applications is presented below.



Test	Units		Energy Level			
			Level 1	Level 2	Level 3	Level 4
CBR Burst Strength (AS 3706.4)	N	MARV	2,750	4,360	6,140	8,850
CBR Toughness (AS 3706.4)	kJ/m^2	MARV	2.7	5.6	8.1	9.3
Wide Strip Tensile Strength MD[1]/XMD (AS 3706.2)	kN/m	MARV	14.8/15.6	21.2/26.6	30.4/38.9	45.5/57.2
Wide Strip Toughness MD/XMD (AS 3706.2)	kJ/m^2	MARV	5.5/5.8	10.2/12.7	14.6/18.6	21.7/30.0
Grab Tensile Strength MD/XMD (AS 3706.2)	N	MARV	820/870	1,250/1,440	1,790/2,160	2,800/3,260
Abrasion Resistance MD/XMD (BAW Rotating Drum)	kN/m Strength Retained	Typical	7.5/6.9	17.3/17.3	22.7/26.2	34.2/40.5

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